Newsletter of the North American Mycological Association

THE MYCOPHILE

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NAMA Annual Foray to take place on . . . the Moon?

Just announced on the NAMA Web site: the 2009 Annual Foray is to take place on the Moon.

When asked if this is to be an actual Annual Foray or a special "exotic foray" (which NAMA has hosted at exotic locations in the past), NAMA President Ike Forester mused, "I'm not sure, myself. It was all Allein's call, and . . . well . . . you know she's always been a little 'far out' anyway!"

When asked about registration, Ann Bornstein was mostly despondent, saying, "Well, I'll be putting together an official announcement by this summer's Foray, but, considering the travel costs involved, I'm not anticipating a big turnout for the Lunar Foray" (as it's now being called).

NAMA member Ken Gilberg, who serves as Secret Ombudsman and Spokesman for the Missourah Mycological Society (and soapmaker to royals), decried that he would be first to sign up and added, " I can't wait to be one of the first humans to gaze upon" the newly described mushroom species found there, *Coprinus lunaensis* (pictured above).

New mushrooms described in 2006

Stalwart MYCOPHILE readers know that at this time each year I like to do a brief wrap-up of the mushroom species described as new to science in the previous year. In 2006 we saw the first descriptions of many truly fascinating species—some from far-away lands, but a few from right here in North America.

Attendees of the Annual Foray in Hinton, Alberta, will no doubt remember seeing *Amanita vernal-poollii* on the ID table (photo courtesy of D. Parker: see page 2, A); even *Amanita* expert Rod Tulloss was at a loss for words!

On a recent trip to the Phi Phi Islands in Thailand, Ken Gilberg

Continued on page 2

Lichenopropinqua pentangulospora Voitk *and* Lichenopropinqua sexangulospora Voitk *fruiting together as one on a lichen-covered branch of Abies terranovense.* (*See story, page 19.*)

Courtesy of D. Parker.

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Mushroom of the Month ..... Wow

Courtesy of D. Parker.

Courtesy of N. Mladenoff.

Courtesy of Maggie Rogers.

Happy April Fools Day, y'all!

Courtesy of K. Gilberg.

New Mushrooms, cont. from page 1

spotted this unusual fruiting of *Ganoderma pseudopalmatum* (C).

The striking *Agrocybe* turned out to be *A. celare,* which David Arora notes is easily identified, when mature, as "the pileus becomes cracked and displays all sorts of gaudy colors—I suppose it's pretty, if you like that sort of thing" (D).

Morchella colosseus (E) is rarely seen in North America but didn't go unnoticed by Dean Abel while on a foray in 2006 in Minnesota. This springtime whopper was found just outside the Twin Cities on a farm owned by a local farmer named Ole

Continued on penultimate page

Courtesy of D. Abel.

BOOK REVIEW

The Mushrooms on the White House Lawn, by Ann Finkbeiner. New York: Viking Press, 2006. ISBN 0-670-03489-4. 104 pp.

Reviewed by Gary Lincoff

Not since *The Mushrooms Outside Lincoln's Bedroom Window* has there been so much talk about a book as has greeted this new edition of *The Mushrooms on the White House Lawn,* by the author of the adequate-seller *The Jasons: The Secret History of Science's Postwar Elite.*

The Mushrooms on the White House Lawn is a fully illustrated field guide, but it is much, much more. There's enough White House history in its pages to satisfy any lover of presidential trivia. Which was President Buchanan's favorite mushroom? What was Julia Grant's recipe for shaggy manes? Which mushroom poisoned a foreign ambassador and almost led to war?

There's humor, too; for example: What stinkhorn was President McKinley compared to by his successor? During the War of 1812 what mushroom killed more British soldiers than ammunition?

The Mushrooms on the White House Lawn is living history, as well as solid natural and social science. From the story of the very first mushroom picked on the White House lawn—identified using the simplest of field-based means—to details on today's high-tech means of customizing a lawn's mycoflora and sequence its genes, we have before us a picture of a young button of a republic mushrooming up to become a fungal colossus on the world stage.

And if you think the White House lawn is forever the same, with only its presidential inhabitants providing a key to changes taking place, think again as you thumb through this treasure trove of fungal discoveries!

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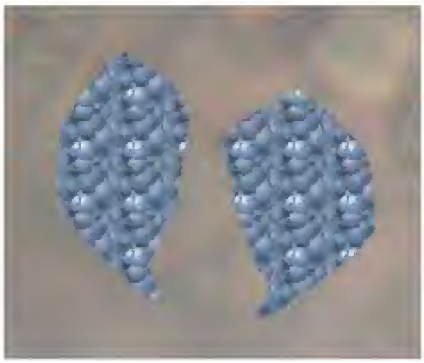

Fig 2. Spores of both cryptic species among some cellular debris. Note the prominent ornamentation, readily shown by the scanning microscope. The angles of the spores are not always evident.

A new pink-spored genus; two new cryptic species . . .

Traditionally, *Entoloma rhodocylix* has been classified with entolomas because of its pink, angulated spores; but physiologically, ecologically, and morphologically, this saprophytic wood-dweller has nothing in common with the mycorrhizal genus *Entoloma*. Angular pink spores are not sufficient logical or biological reasons to lump together otherwise disparate species into one genus.

Therefore a new genus is proposed, *Lichenopropinqua* Voitk, since the specimen grows near lichens but has no relationship with them (Fig. 1, page 1 of this issue). For the English-speaking world it not only makes a passing reference to the pinque spore color, but also makes it clear that this species has no connection to the pink-spored entolomas, i.e. *Lichenopropinqua,* which, translated from the classical Latin, means "like no pro (former) pinks." The former species epithet, *rhodocylix,* meaning "small cap," must also be rejected—as *nomen obfuscatissimum,* because "small" is a relative term requiring a value judgment. [See *Rules of Nomenclature,* Bruxelles, 1948, No 673, §A(17) ii, §§vi–22, "such names should be eschewed by the serious scientific community. . . ."]

On microscopic examination, the spores of this former species are seen to have either five or six angles (Fig. 2). In other situations, species have been differentiated by far lesser than the number of angles of their spores. Quite clearly, then, this is not a single species but one mushroom host, harboring two separate species. Two new species are proposed: *Lichenopropinqua pentangulospora* Voitk and *Lichenopropinqua sexangulospora* Voitk.

Because it is undesirable to give any one mushroom two names (the others get jealous), the concept of predominant species is introduced. This is the species of which the host fruiting body is more full. The predominant species can be readily determined by use of the spore angle index: count the number of five-angled and six-angled spores in 20 randomly chosen spores. Divide the former into the latter. A value >1 is *L. pentangulospora* Voitk and <1 is *L. sexangulospora* Voitk. If you are very busy, count only two spores, multiply by ten, then do the division as above. In case of tie, indicated by a spore angle index of 1.0000, count one additional spore.

This is the first report of such an ultimately cryptic species, whose fruiting bodies are a chimera of two distinct species within the same mushroom.

Note: The holytype, kleptotype and neophyte of both species were sent to Skew Gardens/Les Jardins Skew in Londres, along with the original field notes and Latin diagnosis. These are now lost under a pillar of *fungi.* —*Andrus Voitk*

Humber Village, Newfoundland

New Mushrooms, cont. from page 2

Strandemo. Mr. Strandemo, who describes himself proudly as a self-styled Norwegian bachelor farmer, found the mammoth morel growing beside "the large elm over yonder" but had to rely on his tractor to bring it back for supper. Dean was "excited to see the second biggest morel" of his entire life.

Another striking morel—well three different ones, actually—were found during the big Gary Lincoff Foray in Pennsylvania last year. *Morchella technicolorensis* (G, below). John Plischke tells me three subspecies are known, and for the first time all three were found during the 2006 foray. According to experts in the area, these morels occur only near the town of Kittanning in western PA, and fruit only in the spent compost piles from a long-abandoned mushroom farm that used to commercially raise *Psilocybe* mushrooms for medical research at the Hershey Medical Center.

Many folks around the country reported mass fruitings of giant puffballs in 2006. Maggie Rogers sent in this photo taken in her back yard of a truly gigantic *Calvatia gigantea* (F, page 2). She recently told me that the huge mushroom dried nicely and has since been hollowed out and turned into a storage locker for all her mycological books. (This editor wonders if "Fungal Cave Books" will soon go by a different name!)

The rarely seen *Helvella lacunosa var. sinestrii* (B, page 1) was found during a midnight foray on Halloween night 2006. This sinister looking ascomycete certainly lives up to its name! A big THANKS to all who sent in photos of their spectacular finds!

—*Britt Bunyard*

Courtesy of J. Plischke, III.

Newsletter of the North American Mycological Association

THE MYCOPHILE

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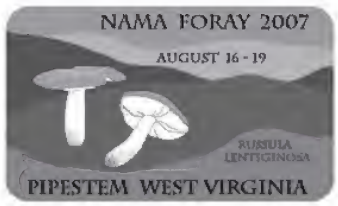
West Virginia: Wild and Wonderful



Pipestem Resort State Park is but a hop, skip, and jump from Orson Miller's old haunts at Virginia Polytechnic Institute and State University: close enough to be a truly suitable site for our Orson Miller Memorial Foray, to be held August 16–19.

Situated in southeastern West Virginia, on the Bluestone River Gorge, this park is, by all reports, an excellent place for mushrooms. Orson certainly took advantage of it. He taught and led forays within the park numerous times.

It is also a favorite hunting ground of Bill Roody's. Bill will serve as our Chief Mycologist this year—who else could know the area mushrooms as he does? Bill and his wife Donna are totally immersed in many aspects of the natural history of their home state and are widely versed on many other wild things beside fungi. Bill wrote *Mushrooms of West Virginia and the Central Appalachians,* which is also filled with his gorgeous photography. We Southerners bless him for it because its use greatly exceeds the specified locality.

Plans include several forays inside the park; some of them may even be walking forays. It will be impossible for us to cover all of the promising surrounding sites, but we'll certainly explore Bluestone State Park, Bluestone Wildlife Management Area, and possibly venture into Camp Creek State Park. There are so many interesting places to investigate in this part of the state that spouses surely won't have a problem entertaining themselves in spite of fungi. Pipestem offers a range of activities including golf, indoor and outdoor swimming pools, fitness room, stables, and canoe rental.

In addition to our forays, we are inviting many of Orson's former doctoral students to share with us some of their career experiences since those student days. They will be able to bring us up to date with the current directions in the mycological world. We also hope some surprise visitors from very far away will join us.

We are thrilled that Hope Miller plans to add her charm and expertise to our endeavors. Her knowledge of the area and the fungi will be a wonderful support for Bill Roody and crew. It is always a delight to have Hope with us.

Accommodations are secured for McKeever Lodge, which is also where our meetings and displays will be. Rooms are similar to those in motel/hotels, with private baths and air conditioning. There are, indeed, elevators. The Lodge also hosts a gift shop, large lounge, dining area, and snack bar. Our additional group of rooms is down by the river. The only access to them is by aerial tram, which is a most enjoyable ride as you drop down the gorge, looking down on the plants and animals below or with a bird's eye view of the stars at night. If nothing else, the tram is worth the visit. In addition, there are campgrounds that offer deluxe sites with water, sewage and hook-ups. Standard sites have electricity only, and tent sites are also included. If you plan to camp, you are encouraged to register as soon as possible due to the demand for camping space. The bathhouses have hot showers and laundry facilities.

Pipestem is 12 miles south of the small town of Hinton and 14 miles north of Princeton. The town of Beckley is within an hour's drive. Both I-77 and I-81 are fairly close. However, Roanoke, VA, or Charleston, WV, are the recommended airports, with Roanoke probably a first choice in most cases.

Please don't forget that mycophagy depends on all of us. Think of the foray when you hit that motherlode and bring some of the largesse along for the tasting. The more we have, the greater the variety and the more exciting the epicurean experience.

For such a prize location, we expect a big turnout. See the May/June MYCOPHILE for more details.

—Allein Stanley

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The Purple Pileus

by Herbert Wells

Mr. Coombes was sick of life. He walked away from his unhappy home, and, sick not only of his own existence but of everybody else's, turned aside down Gaswork Lane to avoid the town, and, crossing the wooden bridge that goes over the canal to Starling's Cottages, was presently alone in the damp pine woods and out of sight and sound of human habitation. He would stand it no longer. He repeated aloud with blasphemies unusual to him that he would stand it no longer.

He was a pale-faced little man, with dark eyes and a fine and very black moustache. He had a very stiff, upright collar slightly frayed, that gave him an illusory double chin, and his overcoat (albeit shabby) was trimmed with astrachan. His gloves were a bright brown with black stripes over the knuckles, and split at the finger ends. His appearance, his wife had said once in the dear, dead days beyond recall—before he married her, that is—was military. But now she called him—it seems a dreadful thing to tell of between husband and wife, but she called him "a little grub." It wasn't the only thing she had called him, either.

The row had arisen about that beastly Jennie again. Jennie was his wife's friend, and, by no invitation of Mr. Coombes, she came in every blessed Sunday to dinner, and made a shindy all the afternoon. She was a big, noisy girl, with a taste for loud colours and a strident laugh; and this Sunday she had outdone all her previous intrusions by bringing in a fellow with her, a chap as showy as herself. And Mr. Coombes, in a starchy, clean collar and his Sunday frock-coat, had sat dumb and wrathful at his own table, while his wife and her guests talked foolishly and undesirably, and laughed aloud. Well, he stood that, and after dinner (which, "as usual," was late), what must Miss Jennie do but go to the piano and play banjo tunes, for all the world as if it were a week-day! Flesh and blood could not endure such goings on. They would hear next door, they would hear in the road, it was a public announcement of their disrepute. He had to speak.

He had felt himself go pale, and a kind of rigour had affected his respiration as he delivered himself. He had been sitting on one of the chairs by the window—the new guest had taken possession of the arm-chair. He turned his head. "Sun Day!" he said over the collar, in the voice of one who warns. "Sun Day!" What people call a "nasty" tone, it was.

Jennie had kept on playing, but his wife, who was looking through some music that was piled on the top of the piano, had stared at him. "What's wrong now?" she said; "can't people enjoy themselves?"

"I don't mind rational 'njoyment, at all," said little Coombes, "but I ain't a-going to have week-day tunes playing on a Sunday in this house."

"What's wrong with my playing now?" said Jennie, stopping and twirling round on the music-stool with a monstrous rustle of flounces.

Coombes saw it was going to be a row, and opened too vigorously, as is common with your timid, nervous men all the world over. "Steady on with that music-stool!" said he; "it ain't made for 'eavy-weights."

"Never you mind about weights," said Jennie, incensed. "What was you saying behind my back about my playing?"

"Surely you don't 'old with not having a bit of music on a Sunday, Mr. Coombes?" said the new guest, leaning back in the arm-chair, blowing a cloud of cigarette smoke and smiling in a kind of pitying way. And simultaneously his wife said something to Jennie about "Never mind 'im. You go on, Jinny."

"I do," said Mr. Coombes, addressing the new guest.

"May I arst why?" said the new guest, evidently enjoying both his cigarette and the prospect of an argument. He was, by-the-by, a lank young man, very stylishly dressed in bright drab, with a white cravat and a pearl and silver pin. It had been better taste to come in a black coat, Mr. Coombes thought.

"Because," began Mr. Coombes, "it don't suit me. I'm a business man. I 'ave to study my connection. Rational 'njoyment—"

"His connection!" said Mrs. Coombes scornfully. "That's what he's always a-saying. We got to do this, and we got to do that—"

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Moving?

Please send your new address, ***two weeks*** before you move, to

Ann Bornstein
NAMA Membership Secretary
336 Lenox Avenue
Oakland, CA 94610-4675
<Membership@namyco.org>

Otherwise—you may not be getting your newsletter for a while. Each issue, several *Mycophiles* are returned as undeliverable because of no forwarding address on file. NAMA is charged ***seventy cents*** for each returned or forwarded newsletter.

NAMA is a 501(c)(3) charitable organization. Contributions to support the scientific and educational activities of the Association are always welcome and may be deductible as allowed by law. Gifts of any amount may be made for special occasions, such as birthdays, anniversaries, and for memorials.

Special categories include
Friend of NAMA: $500–900
Benefactor: $1000–4900
Patron: $5000 and up

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Annual Meeting, Medical Mycology Society of the Americas
May 20–24
Toronto, Ontario, Canada

2007 MSA Meeting & Foray
August 4–9
Louisiana State University, Baton Rouge

This year the Annual MSA Meeting will include a foray on August 5. See the www.msafungi.org for details.

NAMA Annual Foray 2007
August 16–19
Pipestem, West Virginia

Check out details in this and future issues of THE MYCOPHILE and on the NAMA Web site.

COMA's 30th Clark Rogerson Foray
August 23–26
Moodus, Connecticut

This foray is based at Cave Hill Resort, which has an outdoor pool, a small lake and acres of grass and trees. Invited mycologists include Gary Lincoff, Sam Ristich, Roz Lowen, Rod Tulloss, Sandy Sheine, and Leon Shernoff.

The Salmon River State Forest and other nearby parks usually produce basketsful of choice edibles and 300+ different fungal species. Activities will include mycophagy, educational programs and evening marshmallow-toasting over an open bonfire. We can accommodate 70. Contact Don Shernoff at (914) 761-0332 or <donshernoff@ yahoo.com>.

5th International Workshop on Edible Ectomycorrhizal Mushrooms
August 26–29
Chuxiong, Yunnan, China

The Organizing Committee invites you to attend IWEMM5. All aspects of the science of edible ectomycorrhizal mushrooms will be covered. Considerable time will also be devoted to the trade and cultivation of EEMM, which we anticipate will be of benefit to the economic development of the region.

Chuxiong City is the capital of Chuxiong Yi Nationality Autonomous Prefecture, home of the Yi people. This small city of 300,000, located in the center of Yunnan Province, is a most important producer and trader of edible mycorrhizal mushrooms. The equitable climate, fine services and facilities, excellent environment, and warm-hearted Yi people with their rich culture will create a fine atmosphere for the meeting.

The end of August is mushroom season. Hundreds of edible ectomycorrhizal mushrooms, including matsutake and porcini, will be fruiting in the local forests and on sale in area markets. The City has an old quarter with traditional architecture, a National Museum, and the Square of Ten-month Yi Solar Calendar and a Yi ancient town. Nearby there are the Nanhua wild edible mushroom market, the hometown of the famous Lufeng Dinosaurs, the old Black Well town, and Zixishan National Forest Park, which can be visited during or after the meeting. Post-conference field trips will feature the unique flora, fauna, scenery, and local culture of Yunnan.

For information see the Web site (www.iwemm5.com) or contact Wang Yun, Chairman of the Organizing Committee <WangY@ crop.cri.nz>, <wang10melrose @yahoo.com>, or Mr. Liu Zi Qiang, Organizing Committee Secretariat, at <lzqynkm @hotmail.com> or <liuziqiang @cccfna.org.cn>.

4th International Medicinal Mushroom Conference
September 23–27
Ljubljana, Slovenia

The IMMC4 will provide a creative and informative event for mycologists and mycology students, medical doctors, immunologists, contagious disease specialists, naturopaths, ecologists, bioremediators, and all who are interested in studying and discussing the most current research on the biological properties of mushrooms. We invite you to participate in this event. Please visit us at www.immc4.si to register and obtain aditional information about the Congress.

2007 Gary Lincoff Mid Atlantic Mushroom Foray
September 15, 2007

Attention NAMA members: Just 30 minutes north of Pittsburgh, PA, will once again be the site for one of the largest forays in North America. The featured speaker will be Gary Lincoff. Special guest mycologists will be Renee Lebeuf, mycologist for the Cercle des mycologues de Montréal, Bill Russell, author of *Mushrooms of Pennsylvania and the Mid Atlantic,* and Dr. Dave Miller, who has taught mycology at Oberlin College in Ohio. John Plischke III of the W. PA Mushroom Club and Jon Ellifritz of the Mycological Association of Washington, DC, will head the identification tables.

The foray usually draws around 180 people. The area abounds in mushrooms! Mycophagy last year was a 27-course mushroom buffet. If you register by Aug. 15, the price is $40 for 1 or $70 for 2. For more information contact John Plischke, 724-834-2358 or email <morelbp @aol.com>.

2007 Mexican Mushroom Tours
Sept. 21–30

NAMA members may be interested in the very special foraying opportunity we are offering in Mexico this year. For an extended-week excursion, we will take a group of mushroom enthusiasts on a remarkable mycological adventure around the exotic southern state of Chiapas.

Continued on page 6

We'll start this month's review of the literature with *Mushroom the Journal*. The Fall 2006 issue provided much relief for this cabin-bound mycophile. There were two stories about winter mushroom foraying; an intriguing story emtitled "Mushrooms in the Paper Museum," by Skip Kay; "A Very Strange Foray," by the always eccentric Larry Evans; 25 years of painting mushrooms, by Bob Sommer; and an article on mushroom poisoning, by Michael Beug. This issue was full of great stuff, and there's not enough room here to describe it all. If you're interested in anything having to do with wild mushrooms—including cookery, crossword puzzles, and postage stamps—you simply have to subscribe to *Mushroom the Journal*!

Celebrity of the Month: Anne Pringle on NPR's *All Things Considered:* Dr. Anne Pringle, who recently launched a career at Harvard University, is studying the ecology of *Amanita phalloides* (the infamous Death Cap) and its possible role as an invasive species in North America. On the February 9th edition of National Public Radio's "All Things Considered" news program, a reporter followed Anne and her students around the woodlands of the West Coast in pursuit of this deadly mushroom. Anne discussed the ecology of mushrooms as well as the trials and tribulations of making tenure as a college professor. She has authored a number of publications from the ongoing project to determine the origins of *A. phalloides,* including Pringle and Vellinga, 2006, "Last chance to know? Using literature to explore the biogeography of and invasion biology of the death cap mushroom *Amanita phalloides* (Vaill. Ex Fr. :Fr) Link" in *Biological Invasions* (8: 1131–44). Also see Schwartz et al., 2006, "The promise and the potential consequences of the global transport of mycorrhizal fungal inoculum" in *Ecology Letters* (9: 501–15); and Adams, Hallen, & Pringle, 2006, in *Molecular Ecology Notes* (6: 218–20).

From the journals . . .
In *Mycologia* (98[5]: 792–800) Walther and Weiss describe for the first time the anamorphic stages (and illustrate thallic conidiogenesis) in 14 species of mushrooms from the Bolbitiaceae examined in culture. The species studied belong to genera near and dear to us mycophiles, including *Bolbitius, Conocybe,* and *Agrocybe.* Their results corroborate a close phylogenetic relationship between *Bolbitius* and *Conocybe* as well as the polyphyly of the Bolbitiaceae as currently treated, which is consistent with recent molecular phylogenetic studies.

In *Mycological Research* (110[11]: 1333–39), Trappe, et al., published a paper titled "Prescribed burning in a *Eucalyptus* woodland suppresses fruiting of hypogeous fungi, an important food source for mammals." Fruit bodies of hypogeous fungi are an important food source for many small mammals and are consumed by larger mammals as well.

A controversial hypothesis, based on observations made in Tasmania, says that prescribed burning increases fruiting of certain hypogeous fungi. This theory was tested in the Australian Capital Territory to determine if it applied in a quite different habitat. When sampled in early July, after autumn rains had initiated the fungal fruiting season, species richness and numbers of fruit bodies on the burnt plots were extremely low; most plots produced none at all. Both species richness and fruit body numbers were simultaneously high on nonburnt plots. One of the sites was resampled a year after the initial sampling. At that time, species richness and fruit body abundance were still significantly less on burnt plots than on nonburnt, but a strong trend towards fungal recovery on the burnt plots was evident. This was particularly so when numbers of fruit bodies of one species, the hypogeous agaric *Dermocybe globuliformis,* were removed from the analysis. This species strongly dominated the nonburnt plots but was absent from burnt plots both years.

Tips for chanterelle hunters . . .
Also from *Mycological Research* (110[12]: 1433–44), Dunham, O'Dell, and Molina published data on "Forest stand age and the occurrence of chanterelle (*Cantharellus*) species in Oregon's central Cascade Mountains." In this paper, the researchers describe habitat associations of three *Cantharellus* species with respect to stand age. Sampled stands of forest represented two age categories: old growth (350+ years old) and second growth (40 to 60 years old) naturally regenerated from clear-cut harvest. They found stand age to be a good predictor of the distribution of *C. subalbidus* and *C. formosus,* but only marginally useful for predicting the occurrence of *C. cascadensis*. The odds that a randomly located chanterelle mushroom will be *C. subalbidus*, compared to other chanterelles, are 3–23.5 times higher in old growth than in second growth. Alternatively, there is only a 4–38% chance that a randomly located sporocarp will be *C. formosus* in old growth. *C. cascadensis* was found to be uncommon throughout the study area and showed no significant habitat associations. The abundance of *C. cascadensis* increased substantially with decreasing elevation indicating that landscape features other than stand age may be more useful in predicting its occurrence.

From *Discover* magazine (Jan. 2007; 28[1]: 49–49) comes another report on the study done by researchers at Johns Hopkins University on the effects of psilocybin, the

active ingredient in hallucinogenic mushrooms (you heard it here first, several months ago). In summary, Roland Griffiths and his colleagues worked with 36 subjects who had never taken hallucinogens before. Griffiths and a growing number of researchers believe that psilocybin may yield further benefits for the treatment of depression and anxiety. This story seems to have a great deal of staying power in the media; I'll keep you apprised of any new developments.

Speaking of staying power . . . Paul Stamets (the proprietor of gourmet and medicinal mushroom provider Fungi Perfecti) is in the news once again. This time *Chemical & Engineering News* (84[49]: 82–83) is reporting that he has developed a pesticide technology that takes advantage of chemical cues produced during one stage of the life cycle of the green mold fungus *Metarhizium anisopliae* to attract carpenter ants and other insect pests and infect them with the fungus. The technology, which is licensed through Mycopesticide LLC, could be an alternative to traditional chemical pesticides. (Not to gloat, but you also heard this first, here, when we did a review of his terrific book *Mycelium Running* several months ago.)

Zhao et al. report in the journal *Peptides* (27[12]: 3047–52) on the "Pathological effects of the mushroom toxin ±-amanitin on mice." This article is pretty interesting, though a bit technical; the authors were looking at pathological changes to organs of the mouse, as well as to shifts in gene expression, determined through use of the mouse genome on oligonucleotide microarrays ("gene chips"). *Amanita virosa* mushrooms were the source of the toxin and comprised about 2833.8 ¼g/g dry fruiting body; the extracted toxin was injected into the mice. The liver and kidneys showed critical pathological changes after ±-amanitin poisoning, and was detected in liver and kidney tissue homogenates after 48h. The results of the mouse genome gene chip study showed the expression of 146 genes changed (expression of 66 genes decreased, while 80 increased). Therefore, the compound ±-amanitin was found to influence not only RNA polymerase II, but also the expression of its associated genes. The authors suggest that these findings might be helpful for screening the curative drug for ±-amanitin intoxication.

You know how you always hear researchers state that only about 10% of all the fungal species on the planet are currently known (and thus named)? Well, a new report in *Applied and Environmental Microbiology* (72[11]: 7050–56) by Lynch and Thorn supports this belief. The researchers set out to determine the number of basidiomycete species in a soil plot. And get this—they decided to use agricultural soils that are tilled from time to time. Didn't find much, right? Wrong! To their great surprise, they found nearly every group of Basidiomycetes represented there. But there's a twist to their research methods. Rather than determine species present by collecting mushrooms or through lab cultures, the scientists brought soil samples back to the lab, extracted all the DNA present, matched up fungal DNA to known basidiomycete sequences, and determined the species present from this. This is a powerful technique. Most scientists agree that although there may be a tremendous number of mushroom species present in a given habitat (say, your favorite woods), the years they may decide to produce fruitbodies may be few and far between. And you have to be lucky enough to be there at the right spot at the right time. It's little wonder that we mycophiles are a frustrated lot!

More on fungi from soils . . . Microorganisms play a dominant role in Antarctic ecosystems, yet little is known about how fungal diversity differs at sites with considerable human activity as compared to those that are remote and relatively pristine. Ross Island, Antarctica, is the site of three historic expedition huts left behind by early explorers to the South Pole, namely Robert F. Scott and Ernest Shackleton. (If you've not read the unbelievable tale of the Shackleton expedition to reach the South Pole and the ensuing disaster—and amazing rescue!—pick up a copy of *South*.) The fungal diversity of these wooden structures and surrounding soils was investigated with traditional culturing methods as well as with DNA-based methods. From historic wood and artifact samples and soils adjacent to the huts, 71 fungal taxa were identified. The most frequently isolated fungal genera from the historic woods sampled include *Cadophora*, *Cladosporium* and *Geomyces*. The historic huts and associated artifacts have been colonized and degraded by fungi to various extents and these appear to be similar to those species naturally present in Antarctic soils. This study was published by Arenz et al. in *Soil Biology & Biochemistry* (38[10]: 3057–64).

News from Canada . . . Thanks to Bill Richards of the Edmonton club for the next two stories:

Global warming could be responsible for a recent spate of lung infections in the Pacific Northwest, caused by a fungus that used to be known only from the hotter regions of the planet. In 1999 *Cryptococcus gattii* emerged on Vancouver Island, BC, among residents, visitors to the island, and domestic and wild animal populations. The fungus again was detected during 2003–05 in three persons and eight animals; positive environmental samples were detected in areas outside Vancouver Island. In addition, this pathogen was detected in three cats in Washington and two people in Oregon. These findings, published in the January 2007 issue of the Centers for Disease Control's *Journal of Emerging Infecitious Diseases* (Vol. 13, No. 1), may represent an expansion of recognized areas where the

Continued on page 6

Fungi in the News,
continued from page 5

disease is endemic. Unlike the closely related species *C. neoformans,* which is a common opportunistic pathogen of immunocompromised hosts, *C. gattii* affects primarily immunocompetent persons. The fungus is acquired through inhalation of airborne propagules (spores as well as mycelium in dust) and may cause pulmonary and central nervous system disease. Activities that disturb colonized soil or trees (researchers Laura MacDougall et al. have found the fungus to be primarily associated with Douglas fir environs) may increase the likelihood of exposure. Disease acquisition likely also depends on host factors, including underlying lung conditions and oral steroid use. Once infection occurs, the fungus grows in the lung tissue; the disease is not contagious, and it is treatable with antifungal drugs if caught early enough. *Cryptococcus* species are single-celled basidiomycete fungi that are normally found in tropical or subtropical locales in Australia, Africa, India, South America, and the dry areas of the American Southwest.

The chances of contracting *C. gattii* remain low, but this fungus is nothing to sneeze at! If inhaled, the airborne cells and spores can lodge deep in the lungs, leading to pneumonia. The fungus can also attack the central nervous system and result in meningitis. The February 9 edition of the *Globe and Mail* reports that, as of December, 2006, 165 people had been infected; eight died.

In an article in a recent issue of *Endangered Species Update* (Jan.–March 2006; Vol. 24[2]) titled "Mushrooms and the future of CITES" (CITES is the Convention on International Trade in Endangered Species), Peter Thomas reports that no mushrooms may yet be listed on CITES, but recent discussions highlight the willingness of Parties to the Convention to conserve all living things at risk from the demands of international trade. In particular, the American matsutake mushroom has been seen as a potential candidate for listing. CITES reminds us that all nations must contribute to the appropriate regulation of wildlife trade so that the diversity of the Earth will be sustained for future generations.

The treaty's title makes clear that it covers "trade in endangered species of wild fauna and flora." But did "flora" include mushrooms at the time the treaty was negotiated in the early 1970s? In 1961, taxonomists began to split the fungi into a separate kingdom from plants, a change that took some time, but the debate for CITES centered on whether the original negotiators of the treaty thought it covered all "plants" in trade in the broadest sense. Japan and China did not think fungi fell within the jurisdiction of CITES and expressed doubt that any species of fungus was endangered by trade, an assertion questioned by Kenya, Mexico, and Peru. In the end, the Parties adopted a recommendation that CITES should be considered to apply to fungi, with a reservation by the delegation of Japan. Stay tuned for future rulings. In the meantime, enjoy your matsutakes, but in moderation.

Two very important fungal genomes deduced! The filamentous fungus *Aspergillus niger* is widely exploited by the fermentation industry for the production of enzymes and organic acids, particularly citric acid. Besides being of use to industry, aspergilli are also important to humans as saprobes: they spoil just about any of our foodstuffs and are a serious source of mycotoxins picked up in spoiled foods such as peanut butter, cheese, and livestock silage. Aspergilli are a serious pathogen in immunocompromised patients, as well (*Nature Biotechnology* 25: 221–31).

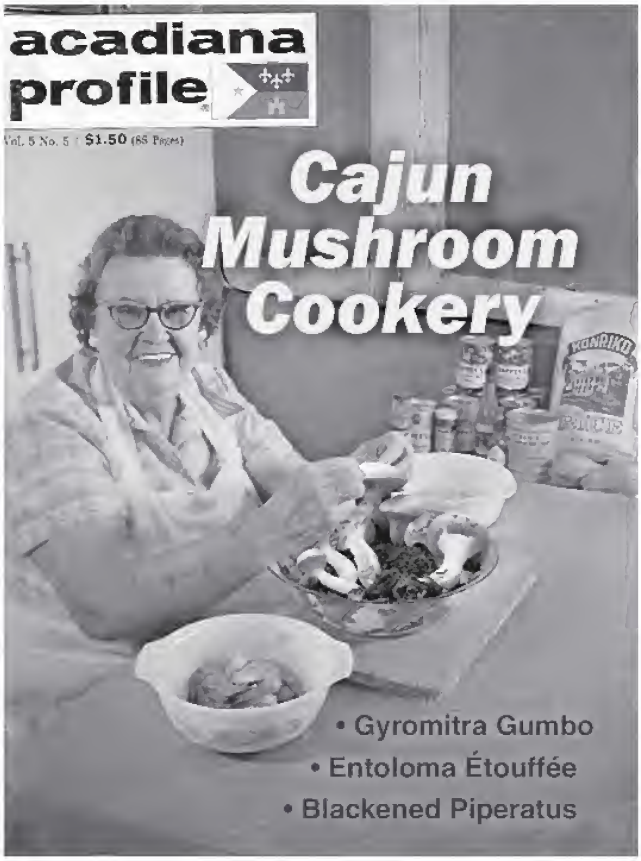
Ustilago maydis is an important fungal pathogen of maize, causing corn smut. It is well adapted to its host and proliferates in living plant tissue without inducing a defense response. The genome sequence of *U. maydis* has now been determined, the first for a biotrophic plant parasite. Several gene clusters that encode secreted proteins of unknown function were identified: genome-wide expression analysis shows that the clustered genes are upregulated during disease. Mutations in these gene clusters frequently affect virulence, ranging from complete loss of pathogenicity to hypervirulence. Researchers have been trying to figure out how this fungus has become such a successful pathogen of corn. Now they may have the key that unlocks a once tightly closed door on this infamous pathogen (*Nature* 444: 97–101).

Forays and Announcements,
continued from page 3

Habitats will range from cool pine cloud forests near San Cristobal and the Lagunas de Montebello, to lush riverside jungles in the Lacandon area bordering Guatemala. As a bonus, this spectacular region offers the chance to experience unmatched archaeology, indigenous arts and cultures, and colorful local traditions. But throughout there will be a focus on fungi, led by top bilingual mycologists in our group.

Early interest from previous Mexican Mushroom Tours participants has been so keen that almost all 22 available spots for this tour have already been booked, but a few seats are not yet confirmed, and, based on interest and demand, we may actually do a second edition of this excursion October 5–14. Details and an itinerary outline appear on the Web site, www.mexmush.com. Contact Gundi Jeffrey & Erik Purre, founders of Myco Aficionados of Mexico; tel./fax: (from El Norte): 011-52 (246) 461-8829 or e-mail <mexmush@yahoo.com>.

Cajun Cookery with Mushrooms!



Alors pas, m'cher!

Just in time for the Annual Foray: A brand new Field Guide!

Field Guide to Wild Mushrooms of Pennsylvania and the Mid-Atlantic, by Bill Russell; 248 pages; 101 color/ 4 b&w illustrations; 1 map; October 2006; 4.5 x 9; 0-271-02891-2. Note: This field guide is normally $19.95, but you can save money by purchasing at the Web-only special price of $15.00.

See page 10 for our reviewer's opinion of this useful new book.

Cajun Chicken Pasta

(as featured in *Cajun Mushroom Cookery*)

4 oz. linguine pasta
2 skinless, boneless chicken breast halves
2 tsp. Cajun seasoning
2 Tbsp. butter
1 red bell pepper, sliced
1 green bell pepper, sliced
Lots of fresh mushrooms, sliced
(amount depends on tastes and foray luck!)
1 green onion, chopped
1 cup heavy cream
¼ tsp. dried basil
¼ tsp. lemon pepper
¼ tsp. salt
⅛ tsp. garlic powder
⅛ tsp. ground black pepper
¼ cup grated Parmesan cheese

Bring a large pot of lightly salted water to a boil. Add pasta and cook for 8 to 10 minutes or until *al dente;* drain.

Place the chicken and the Cajun seasoning in a plastic bag. Shake to coat. In a large skillet over medium heat, sauté the chicken in butter until almost tender (5 to 7 minutes).

Add the red bell pepper, green bell pepper, mushrooms and green onion. Sauté and stir for 2 to 3 minutes—long enough to drive off most of the water from the peppers and mushrooms. Reduce heat.

Add the cream, basil, lemon pepper, salt, garlic powder and ground black pepper. Heat through.

Add the cooked linguine, toss and heat through. Sprinkle with grated Parmesan cheese and serve.

◆ ◆ ◆

This is a good winter dish and works well with store bought mushrooms or dried wild mushrooms. *Bon Appetit!*

Slide ContestWinners for 2006

Due to a technical problem at the printshop, the centerfold of our Jan/Feb '07 issue had some color problems. ColorCraft Printing has graciously offered to reprint these two pages at no charge to NAMA, and we thank them!

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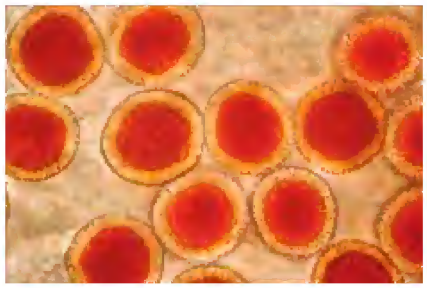

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Pictorial Limited

First Place:
Entomophthora on a hoverfly by Lawrence Leonard ..... A
Second Place:
Phragmidium rust on blackberry by Lawrence Leonard ..... B

Documentary Limited

First Place:
Hypoxylon fragiforme and Its Imperfect: *Nectria episphaeria* by Lawrence Leonard C
Second Place:
Cribraria intricata 8X by Lawrence Leonard ..... D

Pictorial Open

First Place:
Morchella esculenta by David Work ..... E
Second Place:
Pholiota aurivella by Noah Siegel ..... F
Third Place:
Calvatia subsculpa by Ron Pastorino ..... G

Honorable Mention: *Aleuria rhenana* by Ron Pastorino, *Phaeomarasmius erinaceellus* by Walt Sturgeon, *Polyporus alveolaris* by David Work, *Hygrocybe* sp. by David Work, *Omphalotus olearius* by Charles Fonaas

Documentary Open

First Place:
Leucocoprinus birnbaumii by Walt Sturgeon ..... H
Second Place:
Lactarius rubidus by Ron Pastorino ..... J
Third Place:
Coprinus comatus by Charles Fonaas ..... K

Honorable Mention: *Boletus parasiticus* by David Work, *Cortinarius limonius* by Noah Siegel, *Gymnopilus luteofolius* by Walt Sturgeon, *Gomphus clavatus* by Walt Sturgeon; *Clitocybe* by Charles Fonaas

Series

Winner: Lawrence Leonard
Gymnosporangium claviforme on Juniper L
Gymnosporangium claviforme on Hawthorne ..... M
Gymnosporangium claviforme spermagonia ..... N

Judges Option

Gill/Pore Study of *Polyporus squamosus* by Charles Fonaas ..... O
Pleasing Fungus Beetles by Noah Siegel ..... P
"I'm All Ears" *Caloscypha fulgens* by Ron Pastorino ..... Q
Laccaria Gills by Walt Sturgeon ..... R

On the Internet: *To view all the digital photos that won awards or honorable mention, go to http://photos.yahoo.com/namphocon and select the Photo Album entitled* ***06 Awards.***

R

BOOK REVIEWS

A Field Guide to Wild Mushrooms of Pennsylvania the Mid-Atlantic, by Bill Russell. University Park, PA: Pennsylvania State University Press, 2006. ISBN 0-271-02891-2. 236 pp.

Our family was introduced to Bill Russell about 17 years ago by Emily Johnson, a NAMA member and mushroom photographer who also lived in our area. We found him to be knowledgeable and interesting. Bill has been doing mushroom programs and walks in central PA for 50 years. He had all that time to think about what should be put in a mushroom book, and he has done an excellent job.

For the beginning mushroomer, there are a lot of advantages to having a book small enough so one is not overwhelmed by too many mushrooms. The book is 4¾ inches wide, 9¼ inches tall, and about ¾ inch thick. At 236 pages it is a convenient size.

The color pictures are of good quality and large enough to make details of the mushrooms visible.

The book is broken down into seasons: spring, summer, fall, and winter. and there are appropriate pictures in each of the four sections. Both common and scientific names are given. As with most mushroom books there is an occasional mistake, and some names are older taxonomy. There are several paragraphs of narrative that describe each mushroom and also information about cap, pores or gills, spore print, stem, growth, habitat, edibility, and copycats.

There is also a Tips section. For example, the tip on morels is, "In this region, start hunting for morels about a month before apple trees start to blossom. Expect to find them for a couple weeks after blooming ends." This is a nice feature, but one of my favorites is "In a Nutshell," which gives a short synopsis of the mushroom.

The first section of the book is on mushroom basics. This is a concise and worthwhile section to read. The book also has a small but interesting section of recipes. Bill's book claims to be for both beginners and experts, but it covers only 100 mushrooms. I think those hundred common mushrooms are covered well, and this is an excellent book for the beginner and occasional mushroom hunter. *—John Plischke*

Bill Russell and friends

[*Bill will be a special guest mycologist at this year's Gary Lincoff Mid Atlantic Mushroom Foray. The Western PA club is planning to have some copies of Bill's book for sale at club meetings and at the Lincoff Foray.—Ed.*]

The Triumph of the Fungi: A Rotten History, by Nicholas P. Money. New York: Oxford University Press, 2006. ISBN 0-19-518971-X; 196 pp.

Nik has done it again! His previous two books—*Mr. Bloomfield's Orchard: The Mysterious World of Mushrooms, Molds, and Mycologists* and *Carpet Monsters and Killer Spores: A Natural History of Toxic Mold*—were both terrific reads (and should be on all mycophiles' Must Read lists). Well, Nik is back with a third mycological tome. *The Triumph of the Fungi* could be his best book yet.

Triumph of the Fungi is the perfect companion to *Mr. Bloomfield's Orchard.* The latter was a fabulously well-researched and well-written history of the advent of Mycology, with a look at the personal lives of some of the first mycologists. (Dr. Money is a Professor of Botany and mycologist, at Miami University in Oxford, Ohio—just a stone's throw from the famous mycological collections of the Lloyd Library in Cincinnati, which he put to good use in preparing that first book.)

With this third book, Nik's turned his attention to the fungi themselves and their role in the advent of Mycology. The field of Mycology basically began as an offshoot (branch? hypha?) of Plant Pathology. The original mycological research was carried out on economically important fungal plant pathogens. Many of these classic diseases are still plaguing humanity today. *Triumph of the Fungi* recounts some of these legends, dispels some of the perpetuated myths, and all the while keeps the reader's attention with Nik's humorous, and at times edgy, writing style.

The book chapters are a Who's Who of the fungal plant disease Honor Role: "Landscape Architect" (chestnut blight); "A Farewell to Elms" (Dutch elm disease); "The Decaffeinator" (coffee rust); "Chocaholic Mushroom" (witches' broom of cacao); "Rubber Eraser" (rubber blight); "Cereal Killers" (cereal rusts); "Potato Soup" (potato late blight); and "Blights, Rusts, and Rots Never Sleep" (which looks at the global impact of fungal diseases). Historically, many diseases were blamed on all sorts of bogus causes; some still seem to hold sway today. Chestnut blight wiped out all the American chestnut trees and irreversibly altered the landscape of North America, right? Maybe . . . maybe not. And what of the one about Dutch elm disease finding its way to Europe (and then to North America) by way of Asia

Continued on page 15

The North American Mycological Association presents

The Orson Miller Memorial Foray

Pipestem, West Virginia

Thursday, August 16th, through Sunday, August 19th, 2007

Ann Bornstein, Registration
336 Lenox Ave., Oakland, CA 94610-4675
<gramma.ann@att.net> • Tel. (510) 839-2487

Complete both sides of this form and send to Ann Bornstein with your check, payable to ***NAMA '07.***

Name(s): _____

Address: _____

City, State, Zip: _____

Phone: _____ Email: _____

Names and club affiliation for name tags: _____

Assign roommate: ❑ Male ❑ Female I want to share a room with _____

REGISTRATION

Complete package (Thurs. noon to Sun. lunch) ..... includes 3 nights, 9 meals, and all programs	#_____	@ $305 each	$_____
Waiver reason: _____	#_____	@ $0	
Single supplement	#_____	@ $126	$_____
Camping and Commuters ..... includes programs, 6 meals, no breakfasts. Campers must apply directly to Pipestem for reservations.	#_____	@ $155 each	$_____
NAMA Trustees meeting 8/14–8/16 ..... includes 2 nights, 6 meals.	#_____	@ $167	$_____
Single supplement	#_____	@ $ 84	$_____
NAMA membership (required if not current)	#_____	@ $ 35	$_____
Late fee (after June 15)	#_____	@ $ 50	$_____
Mycology student discount: subtract ..... School _____	#_____	–$100	$_____
Vendor Fee (park requirement)	#_____	@ $ 40	$_____
		Total	$_____

Do you require vegetarian meals or have other special concerns? _____

Are you a vendor? Items for sale_____

We must have a signed release for all adults attending the foray. See next page.

LIABILITY RELEASE AND PROMISE NOT TO SUE

I understand that there is some risk in participating in a mushroom foray and conference: all those risks one assumes by being away from home, risks associated with moving about in fields and woods, risks involved in eating wild mushrooms, risks of losing personal property by theft or misplacement, and all other expected and unexpected risks.

In registering for or attending this foray, I agree to assume total responsibility during this event for my own safety and well-being, and that of any minor children under my care, and for the protection of my and their personal property. I release the North American Mycological Association (NAMA), its trustees, officers, employees, contractors, and all other persons assisting in the planning and presentation of this event from liability for any sickness, injury, or loss I or any minor children under my care may suffer during this event or as a result of attending and participating. I further promise not to file a lawsuit or make a claim against any of the persons listed above, even if they negligently cause me or my minor children injury or loss. Finally, I agree to hold NAMA harmless from any liability it may incur as a result of any damages to Hinton Training Center property that I may cause.

This release and promise are part of the consideration I give in order to attend this event. I understand that it affects my legal rights. I intend it to apply not only to me but to anyone who may have the right to make a claim on my behalf.

Signature 1: _____ Date: _____

Print Name 1: _____

Signature 2: _____ Date: _____

Print Name 2: _____

VOLUNTEER OPTIONS

If you can help in any way, please let us know. The volunteer time of our members is what continues to make NAMA forays such a success and great time for everyone. The coordinator will contact you with details prior to the foray.

❏ Display & identification area
❏ Set up ❏ Assist identifiers ❏ Clean up _____

❏ Mycophagy
❏ Set up ❏ Preparation (Sat.) ❏ Clean up _____

❏ Bring mushrooms _____

❏ Van driver (15-passenger vans, no special license required) _____

❏ Other: _____

_____

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2007 NAMA Photo Contest Entry Form

Name: _____
Last First Middle Initial

Address: _____

_____

Phone: (- -) E-mail: < >

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By entering a photograph in this contest, the photographer gives permission for that photo to be reproduced and used by the members and delegates of The North American Mycological Association for educational purposes, and not for the collection of royalties. Except for this stated permission, all other benefits of copyright, including, but not limited to, the right to collect royalties and/or profits from the use, publication, or sale of the photo, remain with the photographer. Persons wishing to publish that photo in any book, periodical, calendar, or other form of profit-making venture, must contact the photographer to negotiate permission, royalties, or sale price.

_____

Signature Date

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D	2	
D	3	
D	4	
D	5	
D	6	
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J	8	
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P	13	
P	14	
P	15	

CATEGORIES

Documentary: Images suitable to identify the fungus or myxomycete to genus ***and species*** in a guide book.

Judges Option: Pictures that don't fit either of the other two categories, e.g. people, humor, etc.

Pictorial: Beautiful pictures of fungi or myxomycetes suitable for a calendar, poster, or coffee table book.

*Your **$4 fee** allows you to enter up to 15 images in either the film or the digital contest. Please enter the titles of your photos on the lines above.*

INSTRUCTIONS FOR SUBMISSION

Entry Fees:

❑ $4.00 for Film Contest

❑ $4.00 for Digital Contest

Total enclosed:

$_____

FILM: Mail color slides, entry forms, and entry fees (check payable to NAMA) to:

John Plischke III
201 Culbertson Ave
Greensburg PA 15601
(724) 832-0271
<fungi01@aol.com>

DIGITAL: Mail files on CD disk, entry forms, and entry fees (check payable to "NAMA") to:

Damian R. Pieper
35 Ventura AV
Iowa City, IA 52245-1638
<NamPhoCon@yahoo.com>

Annual Photo Contest Rules

1. The **Documentary** image must include at least one specimen in situ. i.e., not moved from its original location or altered in any way, except for the removal of detritus or soil that obscures the view of the subject.

2. The photo must include half of a specimen that has been carefully sliced from top to bottom with a plain sharp knife or razor blade. A horizontal section should also be included if it is necessary to exhibit some character such as a hollow/solid/stuffed stipe or other interior structure.

3. If a spore print is useful in the identification of the species, that must also be set somewhere in the frame. The spore print may be omitted if the spore color is already clearly evident somewhere in the frame, or if you attach notes describing the spore color with any standardized color chart or system.

4. For fungi and myxomycetes which change color with development, age, bruising, etc., a shot of the same specimen in each color stage must be included somewhere in the frame.

Images may originate from any flatbed scan, any kind of film, Polaroid, or other digital source. Photographers are encouraged to use any available methods, including computer programs, to correct an inappropriate color balance, over- or underexposure, crop, assemble several images into one frame, etc.

The contest director requests that you create and use a file name for each entry in this form:

- Entry letter & number matching the one on your entry blank
- Genus and species (optional but very helpful)
- Photographers full name or first, middle, and last initials in capitals
- File extension

For example: **D3 Biscogniauxia atropunctata by Johnathan E. Smitherbergmann.jpg**

Any NAMA member may enter the contest. You may enter up to 15 images in each contest. Use two entry forms if you enter both the digital and the film contests.

All entries must be received by May 15, 2007.

Miss Potter's First Love

by Nicholas P. Money

As a depiction of fearsome female independence, the new movie "Miss Potter" omits a significant chapter in the life of its heroine. Beatrix Potter's struggles with her domineering mother and her refusal to marry for money are eclipsed, perhaps, by the manner in which her efforts to become a scientist were snuffed out by Victorian attitudes toward women's education.

Beatrix developed a keen interest in natural history during childhood holidays in Scotland and the English Lake District. Her drawings and watercolors of botanical subjects were greatly admired by Charles Macintosh, a Perthshire postman and amateur naturalist who was one of the few people who encouraged her burgeoning vocation. Her uncle, the chemist Sir Henry Roscoe, was another supporter, but there were very few opportunities for the higher education that she craved. Miss Potter was fascinated by lichens, whose true nature as symbiotic sandwiches of fungi with algal and bacterial fillings had been recognized by Swiss botanist Simon Schwendener in the 1860s, but refuted by the leading lichenologists. Exploring the microscopic structure of these organisms, Beatrix was won over to the theory of their cohabitive nature. In an attempt to become engaged in the world of professional biology, the 30-year-old Ms. Potter arranged an interview with William Thiselton-Dyer, Director of Kew in 1896. She wanted to show him her drawings and discuss the lichen question, but he sidestepped serious analysis of her work in favor of small talk about Kew's hyacinths and the English onion industry. In her coded diary she wrote that "His line was on the edge of civil."

Unfazed by Thiselton-Dyer's dismissal, she continued her mycological investigations, studying the germination of mushroom spores. Barred by her sex from attending meetings of London's Linnaean Society, she convinced a more responsive Kew scientist named George Massee to present her work to the Society Fellows. There is no record of the gentlemen's responses to the paper, but one week later she decided to withdraw it from consideration for publication, planning to do more experiments to strengthen her conclusions. This project was never completed, partly because her books were received with almost instantaneous applause.

Without records of her scientific observations it is impossible to know whether she had accomplished work of any lasting value, but it would be unreasonable to anticipate significant contributions from someone who had received no formal education in the field. Beatrix had no opportunities to learn from expert mentors, no chance to enjoy the rare elation of an experiment that revealed something that no other person had ever known, no avenues for testing her own mettle in the competitive marketplace of Victorian science.

Mycology probably ranks somewhat better than many other scientific specialties in its historical receptiveness to female scholars. In 1910, five years after Thiselton-Dyer's retirement, Elsie Wakefield (1886–1972) was appointed as a mycologist at Kew. She went on to serve as Head of Mycology for 30 years. Other women made tremendous contributions to the field throughout the 20th century. But discrimination against women mycologists didn't end (of course) with the 19th century. Marie Schwarz, a graduate student who discovered the fungal culprit for the Dutch elm epidemic alongside other female researchers in Holland, was ignored by leading scientists in the 1920s. She married in 1926, moved to Indonesia, and had two sons. But there was a second opportunity for Dr. Schwarz. After internment by the Japanese in the second war, during which her husband died, she returned to Holland with her children and resumed her studies on fungi. She lived to see her work on Dutch elm vindicated and enjoyed a long and productive scientific career.

Beatrix Potter's books conveyed her love of the natural world, and the illustrations reveal an intimate knowledge of the animals, plants, and fungi of the British Isles. Far from losing her early interest in fungi, she continued to paint them in their natural settings. The precision of these paintings is clear from the fact that they were used, posthumously, to illustrate a classic guide to mushroom identification. But how much more might the creator of Peter Rabbit and Mrs. Tiggywinkle have given to science in a more enlightened age?

[*Nik Money is Professor of Botany at Miami University in Oxford, Ohio, and is the author, most recently, of* The Triumph of the Fungi: A Rotten History.]

Sources and Notes

Findlay, W. P. K. (1967) *Wayside and Woodland Fungi*. London: Frederick Warne & Co. This is the classic mushroom guide that included 59 color illustrations by Beatrix Potter. Findlay discusses Beatrix Potter's contributions to mycology in Chapter 3, "The Role of the Amateur in Mycology." Good luck finding a copy of this if you want to add it to your mycological library. I was fortunate to find a copy in mint condition on Alibris.com in January, but the original printing does seem to be scarce.

Schmid, R. (1999) "Bamboozled by botany, Beatrix bypasses bigoted biology, begins babying bountiful bunnies: OR Beatrix Potter [1866–1943] as a mycologist: The period before Peter Rabbit and friends." *Taxon* 48: 438–443. If you can make it past the title, this article offers a wealth of useful tidbits about Beatrix Potter's interests in mycology.

Wakeford, T. (2001) *Liaisons of Life: From Hornworts to Hippos, How the Unassuming Microbe Has Driven Evolution*. New York: John Wiley & Sons. In this lively and interesting book, the author revels in microbial diversity, but I think he misrepresents Beatrix Potter's work. Her observations on lichens served only to convince her that other botanists had been correct in their interpretation of these organisms as symbiotic (mutualistic) associations between fungi and photosynthetic partners. Wakeford stretches the truth when he implies that Potter played a heroic role in challenging a Victorian scientific elite who disavowed the symbiotic nature of lichens.

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(specifically, in baskets made of diseased Chinese elm wood)? "Baskets? Doesn't hold water!" Besides hearing the bizarre—and at times hilarious—descriptions of how the causative agents of these diseases were first diagnosed, I also enjoy reading about where possible future research is headed. How about using fungi to fight fungi? Check out the chapter on the chocolate fungus; researchers are looking at ways to use mycoparasites and fungal endophytes to stave off this pest of the world's most economically important plant. Besides retelling the tale of how *Phytophthora infestans* (the cause of potato late blight) may have caused the Irish Potato Famine that wiped out all the potatoes and a large proportion of people in Europe in the mid 1800s (and "put an Irish cop on every street corner on the East Coast"), we learn of the evolutionary origins of this microbe, based on genomic research. It seems this "fungus" (actually, Oomycetes are no longer considered fungi) has genes found only in plants.

The final chapter of this book has some really amazing stories (dinosaur extinctions and fungi may be intertwined!) and some weird ones—for example, the efforts the U.S. government put into investigating fungi for use as biological weapons in the years following WW II. Without spoiling it for anyone, I'll say only that balloons and turkey feathers were to be used in delivery devices. Of course, "No mention of biological warfare is complete without a brief mention of Saddam Hussein." Yep, he's in here too!

Besides being knowledgeable, Nik Money is passionate about mycology. A sign on his laboratory door reads:

Why study fungi? Answer: The Romans invented a god of mildew, called Robigus, who was charged with averting crop diseases. Strictly speaking, this deity was supposed to concentrate on infections caused by rusts rather than mildews, but mycological knowledge was limited in ancient Italy. To rebuff crop damage, worshipers sacrificed a rust-colored dog (and a sheep, for good measure) at the annual festival of Robigalia on April 25. Based on this primeval wisdom, we might try executing someone with a fever to offset global warming. Two thousand years have passed, but fungi remain the greatest threat to our crops. Science offers infinitely better prospects for changing this picture than any prayer, but only if you open this door.

"If you don't mean to study my connection," said Mr. Coombes, "what did you marry me for?"

"I wonder," said Jennie, and turned back to the piano.

"I never saw such a man as you," said Mrs. Coombes.

"You've altered all round since we were married. Before— " Then Jennie began at the turn, turn, turn again.

"Look here!" said Mr. Coombes, driven at last to revolt, standing up and raising his voice. "I tell you I won't have that." The frock-coat heaved with his indignation.

"No vi'lence, now," said the long young man in drab, sitting up.

"Who the juice are you?" said Mr. Coombes fiercely.

Whereupon they all began talking at once. The new guest said he was Jennie's "intended," and meant to protect her, and Mr. Coombes said he was welcome to do so anywhere but in his (Mr. Coombes's) house; and Mrs. Coombes said he ought to be ashamed of insulting his guests, and (as I have already mentioned) that he was getting a regular little grub; and the end was, that Mr. Coombes ordered his visitors out of the house, and they wouldn't go, and so he said he would go himself. With his face burning and tears of excitement in his eyes, he went into the passage, and as he struggled with his overcoat—his frock-coat sleeves got concertinaed up his arm—and gave a brush at his silk hat, Jennie began again at the piano, and strummed him insultingly out of the house. Turn, turn, turn. He slammed the shop door so that the house quivered. That, briefly, was the immediate making of his mood. You will perhaps begin to understand his disgust with existence.

As he walked along the muddy path under the firs,—it was late October, and the ditches and heaps of fir needles were gorgeous with clumps of fungi,—he recapitulated the melancholy history of his marriage. It was brief and commonplace enough. He now perceived with sufficient clearness that his wife had married him out of a natural curiosity and in order to escape from her worrying, laborious, and uncertain life in the workroom; and, like the majority of her class, she was far too stupid to realise that it was her duty to co-operate with him in his business. She was greedy of enjoyment, loquacious, and socially minded, and evidently disappointed to find the restraints of poverty still hanging about her. His worries exasperated her, and the slightest attempt to control her proceedings resulted in a charge of "grumbling." Why couldn't he be nice— as he used to be? And Coombes was such a harmless little man, too, nourished mentally on *Self-Help,* and with a meagre ambition of self-denial and competition, that was to end in a "sufficiency." Then Jennie came in as a female Mephistopheles, a gabbling chronicle of "fellers," and was always wanting his wife to go to theatres, and "all that." And in addition were aunts of his wife, and cousins (male and female) to eat up capital, insult him personally, upset business arrangements, annoy good customers, and generally blight his life. It was not the first occasion by many that Mr. Coombes had fled his home in wrath and indignation, and something like fear, vowing furiously and even aloud that he wouldn't stand it, and so frothing away his energy along the line of least resistance. But never before had he been quite so sick of life as on this particular Sunday afternoon. The Sunday dinner may have had its share in his despair—and the greyness of the sky. Perhaps, too, he was beginning to realise his unendurable frustration as a business man as the consequence of his marriage. Presently bankruptcy, and after that— Perhaps she might have reason to repent when it was too late. And destiny, as I have already intimated, had planted the path through the wood with evil-smelling fungi, thickly and variously planted it, not only on the right side, but on the left.

A small shopman is in such a melancholy position, if his wife turns out a disloyal partner. His capital is all tied up in his business, and to leave her means to join the unemployed in some strange part of the earth. The luxuries of divorce are beyond him altogether. So that the good old tradition of marriage for better or worse holds inexorably for him, and things work up to tragic culminations. Bricklayers kick their wives to death, and dukes betray theirs; but it is among the small clerks and shopkeepers nowadays that it comes most often to a cutting of throats. Under the circumstances it is not so very remarkable—and you must take it as charitably as you can—that the mind of Mr. Coombes ran for a while on some such glorious close to his disappointed hopes, and that he thought of razors, pistols, breadknives, and touching letters to the coroner denouncing his enemies by name, and praying piously for forgiveness. After a time his fierceness gave way to melancholia. He had been married in this very overcoat, in his first and only frock-coat that was buttoned up beneath it. He began to recall their courting along this very walk, his years of penurious saving to get capital, and the bright hopefulness of his marrying days. For it all to work out like this! Was there no sympathetic ruler anywhere in the world? He reverted to death as a topic.

He thought of the canal he had just crossed, and doubted whether he shouldn't stand with his head out, even in the middle, and it was while drowning was in his mind that the purple pileus caught his eye. He looked at it mechanically for a moment, and stopped and stooped towards it to pick it up, under the impression that it was some such small leather object as a purse. Then he saw that it was the purple top of a fungus, a peculiarly poisonous-looking purple: slimy, shiny, and emitting a sour odour. He hesitated with his hand an inch or so from it, and the thought of poison crossed his mind. With that he picked the thing, and stood up again with it in his hand. The odour was certainly strong—acrid, but by no means disgusting. He broke off a piece, and the fresh surface was a creamy white, that changed like magic in the space of ten seconds to a yellowish-green colour. It was even an inviting-looking change. He broke off two other pieces to see it repeated. They were wonderful things these fungi, thought Mr. Coombes, and all of them the deadliest poisons, as his father had often told him. Deadly poisons!

There is no time like the present for a rash resolve. Why not here and now? thought Mr. Coombes. He tasted a little piece, a very little piece indeed—a mere crumb. It was so pungent that he almost spat it out again, then merely hot and full-flavoured: a kind of German mustard with a touch of horse-radish and—well, mushroom. He swallowed it in the excitement of the moment. Did he like it or did he not? His mind was curiously careless. He would try another bit. It really wasn't bad—it was good. He forgot his troubles in the interest of the immediate moment. Playing with death it was. He took another bite, and then deliberately finished a mouthful. A curious, tingling sensation began in his finger-tips and toes. His pulse began to move faster. The blood in his ears sounded like a mill-race. "Try bi' more," said Mr. Coombes. He turned and looked about him, and found his feet unsteady. He saw, and struggled towards, a little patch of purple a dozen yards away. "Jol' goo' stuff," said Mr. Coombes. "E—lomore ye'." He pitched forward and fell on his face, his hands outstretched towards the cluster of pilei. But he did not eat any more of them. He forgot forthwith. [To be continued in the next Mycophile.]

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THE MYCOPHILE

Mushroom of the Month

The newly described Cantharellus titans *was found at the 2006 Annual Mingo Foray in Missourah. To see other new and interesting species of mushrooms, dive into this issue. Brad Bomanz and Kate Garst are the happy discoverers; photo courtesy of Ken Gilberg.*